

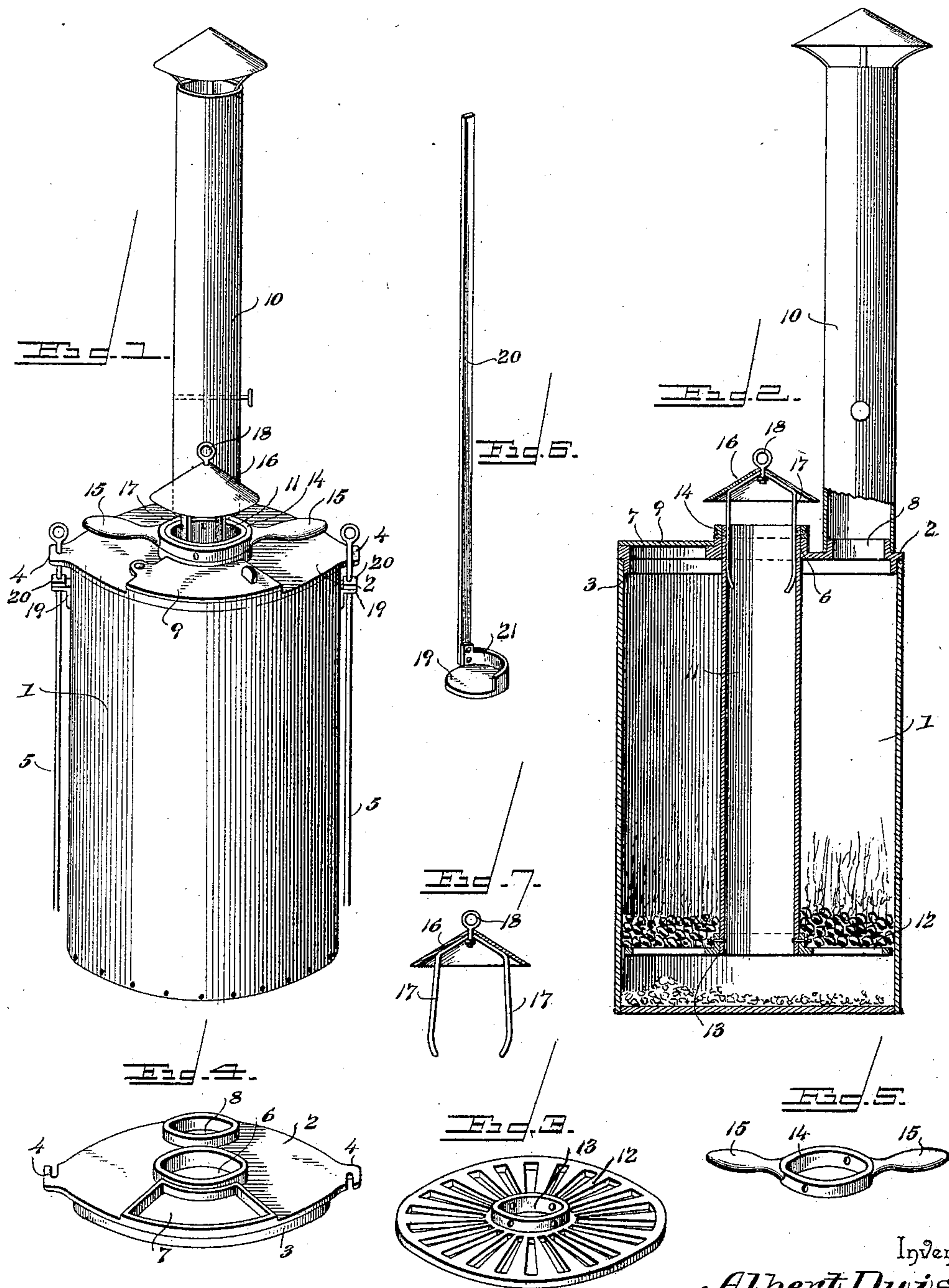
No. 616,185.

Patented Dec. 20, 1898.

A. DUIS.
TANK HEATER.

(Application filed Dec. 29, 1897.)

(No Model.)



Witnesses
E. K. Stewart
V. B. Hillyard

By *his* Attorneys,

C. A. Snow & Co.

Inventor
Albert Duis

UNITED STATES PATENT OFFICE.

ALBERT DUIS, OF STREATOR, ILLINOIS.

TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 616,185, dated December 20, 1898.

Application filed December 29, 1897. Serial No. 664,227. (No model.)

To all whom it may concern:

Be it known that I, ALBERT DUIS, a citizen of the United States, residing at Streator, in the county of La Salle and State of Illinois, have invented a new and useful Tank-Heater, of which the following is a specification.

This invention relates to that class of heaters which are intended to be immersed in the water to be prevented from freezing or raised to the required temperature for any purpose, and has for its object to secure a maximum amount of heating-surface compared with the size of the heater, to provide for an automatic control of the draft for supporting combustion, as well as to enable the said draft to be regulated at will, and to construct the heater so that its interior may be readily accessible for any purpose without requiring the removal of the body from the tank or other reservoir containing the water whose temperature is to be raised.

For a full understanding of the merits and advantages of the invention, reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of the tank-heater. Fig. 2 is a vertical central section thereof. Fig. 3 is a detail view of the grate. Fig. 4 is a detail view of the head or cover. Fig. 5 is a detail view of the collar, formed with handles, and which is attached to the upper end of the draft-pipe. Fig. 6 is a detail view of the ash-shovel. Fig. 7 is a detail view of the cap for controlling the admission of air into the draft-pipe.

Corresponding and like parts are referred to in the following description and indicated in the several views of the drawings by the same reference characters.

The body of the heater may be of any desired form, and, as shown, is of cylindrical outline and has its lower end closed by a head, which is riveted thereto in substantially the same manner as commonly practiced in heading boilers.

The heater is water-tight to prevent leakage when immersed in the body of water whose temperature is to be raised.

The upper end of the heater is closed by a cover or head 2, having a depending flange 3 to enter the upper end of the body 1, and is provided with offstanding ears 4, which are apertured for the passage therethrough of anchoring-rods 5, by means of which the heater is secured firmly to the bottom of the tank or reservoir into which it is placed. The cover or head 2 is formed with a middle and side openings 6, 7, and 8, respectively, which are surrounded by vertical flanges. The opening 7 is for the admission of fuel, and is closed by a door 9, which is pivoted at one end and adapted to swing horizontally at its opposite or free end. The smoke-pipe 10 is fitted to the flange of the opening 8, and the draft-pipe 11 is thrust through the opening 6.

The grate 12 has a central opening 13, which receives the lower end of the draft-pipe 11, to which it is bolted or firmly attached in any desired way, and is of a size to fit easily within the body 1, so as to be turned or moved vertically. A collar or ring 14 is secured to the upper end of the draft-pipe and normally rests upon the flange surrounding the opening 6 and holds the draft-pipe and grate in suspension. This collar has handles 15 extending therefrom at opposite points to grasp when it is required to turn the draft-pipe for shaking the grate or lifting it to remove the grate and cover 2 when access is to be had to the interior of the heater for any purpose.

A cap 16 is fitted to the upper end of the draft-pipe and can be adjusted to regulate the space between it and the draft-pipe, so as to control the admission of air at will. This cap may be of any form, but is preferably of conical shape. Spring-arms 17 are secured to the cap and are adapted to enter the upper end of the draft-pipe and hold the cap in the required position by reason of their frictional engagement with the sides of the draft-pipe. The lower ends of the spring-arms 17 are bent inwardly to facilitate the entrance of the arms into the draft-pipe when placing the cap in position. The spring-arms 17 are preferably formed by bending a piece of strap-iron upon itself and securing it to the cap, the means of attachment being an eyebolt 18, which passes

centrally through the cap and an opening formed at a middle point in the length of the strap-iron from which the spring-arms 17 are formed.

5 The draft-pipe is centrally disposed, and the space between it and the body of the heater constitutes a combustion-chamber through which the smoke and gases pass on their way to the smoke-pipe. The fire is supported directly upon the grate 12 and the
10 ashes drop into the space formed between the grate and the bottom of the heater, said space constituting the ash-pit. When the fire becomes choked, it is freed from ashes by grasping the handles 15 and turning the draft-pipe
15 backward and forward, which imparts a shaking movement to the grate and effects the desired result. The ashes are removed from the ash-pit by a shovel or scoop 19, affixed to the lower end of a pole or rod 20, said shovel
20 being of circular form and having a vertical rim 21 extending half-way around and constituting a guard to retain the ashes gathered upon the shovel. This shovel is of a size to
25 be introduced through the draft-pipe after the cap 16 has been removed. The depending flange or rim 3 of the cover 2 retains the latter in place and is engaged by the grate 12 when the latter is lifted and serves to prevent the falling of any fire or fuel from the
30 grate into the water when removing the grate, draft-pipe, and cover from the body of the heater. When the interior of the heater is to be reached for any purpose, the draft-pipe is elevated by means of the handles 15, and
35 when the grate comes in contact with the flange 3 the cover 2 is unseated and moves with the draft-pipe and grate and can be placed aside until the necessary inspection
40 or repairs have been made.

As before described, the draft enters through the pipe 11 into the ash-pit and passes up through the grate 12 to support combustion, and the smoke and gases escape through the
45 smoke-pipe 10. When the fire is burning briskly, the pipe being heated, there is a tendency to create an upward draft in the pipe 11, which in a measure counteracts the inflow of air, thereby acting to check the draft and
50 dampen the fire and cause the latter to burn less briskly. As the intensity of the fire decreases the upward tendency of the draft in the pipe 11 proportionately lessens, thereby offering less resistance to the inflowing air,
55 thereby permitting a stronger draft, which will cause the fire to burn brighter. It will thus be seen that the construction provides for an automatic control of the draft within certain limits. The draft is also under the control of the attendant and can be regulated
60 by moving the cap 16 up or down, so as to vary the space formed between it and the upper end of the draft-pipe.

In order that the cover may be easily removed without necessitating the removal of the anchoring-rods, the passages in the ears
65 4 open through the latter in opposite direc-

tions, as shown most clearly in Fig. 4, thereby admitting of the said ears being detached from the rods 5 by turning the cover slightly, as will be readily understood. In order that the body 1 may not be displaced when the cover is removed, it is formed with lateral ears or lugs 19, which are apertured for the passage therethrough of the rods 5, the latter being provided with shoulders or stops 20 to engage with the upper sides of the said lugs, thereby attaining the desired end.

Having thus described the invention, what is claimed as new is—

1. In a heater, the combination of a body having its cover formed with an opening, a draft-pipe passing through said opening and adapted to have movement therein, a grate secured to the draft-pipe, and a handle extending laterally from the draft-pipe for imparting movement to the same; substantially as described.

2. In a heater, the combination of a body having its cover formed with an opening, a draft-pipe passing through the said opening, a grate secured to the lower end of the draft-pipe, and a collar secured to the upper end of the draft-pipe and adapted to engage with the cover and hold the draft-pipe and grate in suspension, and provided with handles by means of which the draft-pipe can be turned and elevated, substantially as set forth.

3. In a device of the nature indicated, a body, a cover closing the upper end of the body and having upward movement therefrom to uncover the body, said cover being provided with an opening, a draft-pipe passing through the opening and adapted to be elevated, and a grate secured to the draft-pipe and adapted when elevated to engage the cover and remove it from the body; substantially as described.

4. In combination, a body, a cover closing the upper end of the body and having a depending rim and an opening, a draft-pipe passing through the opening and adapted to be elevated, and a grate secured to the lower end of the draft-pipe and adapted when elevated to engage with the rim of the cover and remove it from the body, substantially as described.

5. In a tank-heater, the combination of a body having offstanding ears, anchoring-rods passing through openings in the said ears and having stops or shoulders to engage with the upper sides thereof so as to retain the body in place, and a cover detachably fitted to the body and having offstanding ears provided with passages to receive the upper ends of the aforesaid rods, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALBERT DUIS.

Witnesses:

E. H. BAILEY,
S. W. PLUMB.